1:Williams E,G-5 (1923-1925) 1930
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137 cleared for native gardens, some is still virgin, being distinguished by the presence of giant trees with spreading flanges or buttresses. The forest presents an infinite variety, with this important characteristic, that the variety is for ever repeating itself, so that a man who requires any particular product usually has not far to seek.

137 With few exceptions the trees are soft-woods, and these supply easy material for canoes and much of the house-
● 313 building. One or two varieties of hard-woods are used for
[411] spears, but these weapons as well as the wooden 'sword' are usually made from the tough and springy *Koropa* palm. Other palms provide the slats used in flooring; and the
137 pandanus, most useful of all, is valued for its fibre which is
314 twisted into rope, and for its broad leaves which are sewn together to form the sleeping mat. One variety is prized
[267] for its fruit, a long red seed-cluster, which is boiled down to a porridge.

137 One of the greatest natural assets of the Orokaiva is his sago. In the interior the palm is comparatively rare and each
313 tree is carefully husbanded, but along the lower reaches of the rivers, where they are bordered by swamps of very great extent, the sago grows in a quantity which, as far as native wants are concerned, is probably inexhaustible. As a diet it
[262] is secondary to the taro, but among the river-dwellers at least it provides an unfailing resource in times of scarcity. The sago leaf thatches the house, and the midrib nowadays commonly forms the walls of the house. In the dismal swamps of the coast the *Nipa* palm furnishes another material for thatching, and the mangrove one of the most adaptable of native timbers.

137 Comparatively few fruit-bearing trees are found in the bush. The only exceptions of much consequence are the
262 several varieties of bread-fruit, the *Okari* nut, and the tree called *Puga*. Mangoes are uncommon and of inferior quality, and of the numerous varieties of wild fig only one or two may be called edible. But there are numerous herbs, ferns, and tree leaves which always lend variety to Orokaiva cookery, and when scarcity prevails at the height of the South-East season may even become a stand-by. Indeed,

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THE FOOD QUEST

Gardening

241 LIKE most inhabitants of Papua the Orokaiva are essentially gardeners. As their methods have already been described and criticized in another report,[1] they may be dismissed rather briefly in this; though it will not be forgotten that gardening is the first and foremost activity of the food quest and deserves more space than it will receive here.

The principal product is taro (*ba*); others of importance are sweet potatoes (*kerroja*), yam (*kai*), banana and plantain (*pije*), sugar-cane (*jou*), and a variety of andropogon called *ina*. Coco-nuts (*bu*) and betel palms (*sa*) are cultivated everywhere, and the bread-fruit (*oga* and *eumba*), a food of some importance which grows wild, is also found in many villages and gardens.

Though effective enough the gardener's methods are primitive and wasteful. Fresh ground is continually cleared for new plantings, the crop matures and is harvested, and after that the plot is surrendered to the bush. Thus many areas are cleared and planted in succession, until in course of time the gardener finds himself at work on an area which he or his fathers cleared perhaps a score of years before. The gardens of a number of families, sometimes of a whole village, lie side by side in the same clearing, which will often enough be 100 acres and more in area.

241 When clearing is in progress an advance party of wife and
313 children tear or cut away the undergrowth (*undaki*), and the husband follows with his trade axe. He cuts the trees at a level of some three or four feet above ground, and thus leaves an untidy forest of stumps which continue to sprout luxuriantly as the garden grows. An especially large tree may be left standing, but if the clearers have the requisite

[1] 'Orokaiva Garden Culture' (Report No. 7), in *Orokaiva Magic*.

1:Williams E,G-5 (1923-1925) 1930
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energy they erect a scaffolding around it to enable them to attack the trunk above the wide buttress-like flanges which are characteristic of so many Papuan trees. Of the smaller tree-trunks some are laid out to mark off one plot from another—for the gardens of the whole clan are likely to be grouped in the same large clearing—others are stacked in pyramids to dry for firewood. The litter of branches and leaves is gathered into heaps and burnt. It would seem that the ideal is to have the ground as bare as possible before planting, and an exceptionally neat gardener will even go to the length of sweeping up the ashes from the burning. But the larger obstacles remain, and the garden will inevitably be obstructed with tree-trunks and those knotty roots which lie on the surface in the tropical bush.

There is no tilling of the soil and no manuring save indirectly through the burning of leaves and branches. There is no attempt at drainage or irrigation; indeed, both would be somewhat difficult on the plains, owing to their low gradient. In the sometimes protracted dry spells the taro offsets must be planted near swampy ground.

The only implement used in actual gardening is the digging stick—usually a hardwood stake which may be improvised on the spot. Sometimes it takes the form of a well-finished crow-bar of black palm-wood with a spatulate point. In planting, the digging stick is driven into the ground and levered back and forth so as to increase the size of the hole. Then the gardener, not deigning to stoop, shoots his taro-top cleverly into its place, adjusts it, if necessary, by means of his nimble great toe, and lightly treads in the earth. Yams are propagated from shoots, being kept in the darkness of the yam-house until the shoots appear. The gardener knows how to plant from cuttings (sugar-cane and *ina*), from suckers (banana), and from seeds (tobacco and some minor garden products), and he transplants rooted seedlings of trees (bread-fruit and the *ajimo* or bark-cloth tree).

The garden is weeded from time to time by women, but when once the taro is well established, it is often left to contend with the weeds. A rough fence surrounds the whole

2: Williams E, G-5 (1923-1925) 1928
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241 311 [412] true reason is so obvious to the native that he seldom thinks of explaining it. The Rotation of Areas is, in fact, a labour-saving device. With the implements at his disposal—formerly his finger-nails, a stick, and a stone axe, nowadays his finger-nails, a stick, a tomahawk, and an 18-inch trade-knife—it is infinitely more difficult to overcome the dense mass of vigorous weeds and bushes which spring up in the wake of the taro, than to clear away the bush of ten years' standing, with its somewhat meagre trees and straggling underwood. It is the primary growth which the native gardener cannot cope with. What he does is to leave the matter to nature. After a few years the saplings have sprung up and overshadowed the weeds and shrubs, and in due course as the bush develops these latter are replaced by a much thinner and less formidable array of trailers and forest undergrowth. Even in bygone days, when a tree had to be brought down with a stone axe, this light bush was an easier problem than the primary growth; now that stone has been replaced by steel, it is easier beyond all comparison.

241 ● 313 461 [533] Sometimes the village will be almost deserted, while its population—men, women, and children—are together engaged in clearing. The work proceeds with a leisurely persistence, continual conversation, and occasional spells, when the woodman sits on a fallen tree and rattles his lime-stick and chews his betel. Now and again some cheerful worker will burst into song as he wields his axe, a mere bar or two of melody, sung at the top of his resonant Orokaiva voice. In beginning and ending it is strangely abrupt, more like a musical shout or a yodel than a song, and altogether a very good-humoured sound.

241 313 Tree felling is for the men; the cutting and dragging aside of undergrowth for the women and children. The heavier trees are suffered to lie where they fall, and will remain till long after the garden has been used and deserted. The lighter timber is stacked in high pyramids to dry for firewood, or else used, end for end, as borders for individual plots. Only the branches, leaves, and

2: Williams E, G-5 (1923-1925) 1928
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undergrowth are burned in the clearing. It is the custom to cut trees at a height of three or four feet from the ground, no doubt because this is easier. The resultant forest of stumps may look somewhat untidy, but they are regarded less as obstacles than as conveniences—pillars for the trailing yams, props for the sugar-cane, hat-stands and clothes-horses on which a man may hang his knitted bag in order to keep an eye on it, or a woman her sole garment, the bark-cloth skirt, for greater freedom when working alone at her weeding. The roots are not grubbed, and the soil, though superficially clean, is full of potential rivals for the vegetables which are soon to be planted.

There is a matter associated with clearing and the Rotation of Areas which has long been a cause for some anxiety. This is the spread of the grass plains [1] and the consequent deforestation of certain parts of the Division. It may be worth while putting down the result of my own observations in this matter, though they are not those of a botanist or a forester.

The grass lands are particularly noticeable in the Dobodura district, and to a less extent around Ambasi; but farther inland they are again very prevalent along certain parts of the river Kumusi and here and there along the Mamba and Gira. I have always assumed that some at least of the wide tracts of *kurokuro* are natural. The fact that they are frequently met with along the river banks, where there are here and there distinct evidences of terracing, suggested that in some cases a newly deposited river-flat might happen to be clothed with long grass rather than with bush. However, the question whether the grass is natural or no need not really concern us.

The practical issues are whether the grass country is extending, and, given that it is, what are the causes for its extension. From native informants—whose word may certainly be accepted in such a matter—I have definite instances in which the bush has encroached upon

[1] Vide p. 111, note.